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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/593,607

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Takeo Yajima

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EXAMINER

HILTON, ALBERT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/593,607	Applicant(s) YAJIMA, TAKEO	
	Examiner Albert Hilton	Art Unit 4171	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 December 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) 1-4 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 5-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The objection to Figure 8 is withdrawn in view of the submitted replacement sheet.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over YAJIMA (Japanese Patent No. JP-11230048) in view of KAWATA (US Patent No. 6932353). (The rejections refer to machine translation of the JP reference)**
3. Regarding claim 9, YAJIMA describes a chemical supply apparatus in which a liquid accommodated in a liquid tank (**fluid tank 15**) is dispensed from the nozzle of a nozzle body (**nozzle 17**), the apparatus comprising an elastically deformable and tube-shaped flexible film (**flexible tube 21**) forming a pump room (**pressurization room 22**) having one end communicating with a primary-side liquid flow path (**supply-side channel 14**) communicating with the chemical liquid tank (**15**) and whose other end communicates with a secondary-side liquid flow path (**side channel 16**) communicating with the nozzle body (**17**) (YAJIMA: paragraphs 13-14, and Fig. 1), wherein when the flexible film (**21**) expands the volume of the pump room (**22**), the

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liquid in the liquid tank (15) is sucked into the pump room (22), and when the pump shrinks the volume of the pump room (22), the liquid in the pump room (22) is dispensed to the nozzle body (17) (YAJIMA: paragraphs 10, 17, and Fig. 4); a nozzle assembly, in which the pump, the nozzle body (17), a primary-side valve (valve 18) for opening/closing the primary-side flow path (14), and a secondary-side valve (valve 19) for opening/closing the secondary-side flow path (16) are provided (YAJIMA: paragraph 14 and Fig. 1).

4. YAJIMA does not disclose the use of a double tube disposed containing the primary-side flow path (14) and the internal tube (21), and in which temperature-controlled water flows. However, KAWATA discloses a chemical-dispensing apparatus having a heat exchanger (10, 11) consisting of an inner tube (pipe 9) through which the chemical (5) flows, and an outer tube (10, 11) through which temperature-regulated water (7) flows (KAWATA, column 2, line 60 to column 3, line 13). The temperature control water (7) of KAWATA is regulated by a temperature controller (**controller of the constant-temperature water circulating means**) (KAWATA: column 6, lines 1-5). Furthermore, KAWATA teaches that the temperature of the deposited resist fluid in a dispensing apparatus affects the resulting film thickness, and that when the temperature of the resist liquid is carefully controlled with a double-tube heat exchanger, the film uniformity is improved (KAWATA, column 1, lines 35-54). One of ordinary skill in the art, motivated by a need to precisely control the thickness of a deposited film, would have found it obvious to improve upon the apparatus described

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in YAJIMA by substituting the double tube component of KAWATA for the single tube of YAJIMA.

5. Further regarding claim 9, KAWATA teaches that the heat exchangers **(10, 11)** are located around the inner tube **(9)** along the entire transport path of the chemical from source to nozzle (KAWATA: column 3, lines 28-31 and Fig. 2). As the flexible tube of YAJIMA **(flexible tube 21)** is part of the flow path of the apparatus, the incorporation of KAWATA's double-tube heat exchanger into the apparatus of YAJIMA would result in an apparatus in which the flexible tube **(21)** is disposed within the double tube. The flow path of the temperature controlled water would therefore be formed in the pump.

6. Claims 10-12, and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over YAJIMA in view of KAWATA as applied to claim 9 above, and further in view of SUTTER (US Patent Application No. 2002/0157815).

7. Regarding claims 10-11, YAJIMA in view of KAWATA does not explicitly describe either the use of a coupling block at the end portion of the double tube and a first branch path, which causes temperature control water to flow from the external tube to the temperature control water flow path or the use of a coupling block at a second end portion of the double tube and a second branch path, which causes temperature control water to flow from the temperature controller to the external tube. However, the use of such a coupling block is known in the art, as exemplified by SUTTER, which teaches the use of two coupling blocks **(couplers 14)** located at first and second branch paths **(first end 121, and second end 122, respectively)** at the

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two ends of a double tube (**double tubing 12**) (SUTTER: paragraph 20 and Fig. 1).

SUTTER further teaches that said couplers (**14**) allow for the double tube (**12**) to be attached to external equipment (SUTTER: paragraph 20). One of ordinary skill in the art at the time of the invention, motivated by a need to couple a temperature controller to the double tube in the combined references of YAJIMA and KAWATA, would therefore have found it *prima facie* obvious to make use of the coupling blocks of SUTTER.

8. Regarding claim 12, the tube of SUTTER which causes the temperature control medium to flow back to the temperature controller (**external equipment**) (*i.e.*, the middle tube in between tubes **121** and **20** in SUTTER: Fig. 1) is connected between the temperature control water flow path (**outer tube 22**) and the temperature controller (**external equipment**) (SUTTER: paragraph 20 and Fig. 1).

9. Regarding claim 5, YAJIMA in view of KAWTA and SUTTER discloses a flexible film (**flexible tube 21**) provided in a driving room (**pressurization room 22**) filled with a driving medium (**pressurization medium M**), the flexible film (**21**) being expanded by decreasing the pressure of the driving medium (**M**) and the flexible film (**21**) being shrunk by increasing the pressure of the driving medium (**M**) (YAJIMA: paragraph 17 and Fig 3).

10. **Claims 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over YAJIMA in view of KAWTA and SUTTER as applied to claims 5 and 10-12 above, and in further view of KAWANO (US Patent No. 6258167).**

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11. Regarding claim 6, YAJIMA in view of KAWTA and SUTTER does not teach a movable arm connected to a nozzle assembly. However, KAWANO discloses a chemical supply apparatus having a nozzle assembly **(20)** attached to a movable arm **(movable member 34)** (KAWANO, column 1, lines 48-50, and KAWANO, Figures 4 and 6). KAWANO teaches that using a movable arm to deposit material in a coating apparatus to coat the entire length of a substrate and to maintain a constant height above the substrate results in a coating film having uniform thickness. (KAWANO, column 4, lines 37-45 and column 5, lines 1-10). One of ordinary skill in the art, motivated by a need to precisely control the thickness of a film deposited by the apparatus of the YAJIMA in view of KAWTA and SUTTER, would have found it obvious to improve upon the apparatus of the combined references by placing the dispensing pump inside a movable arm.

12. Regarding claim 7, YAJIMA in view of KAWTA and SUTTER teaches a driving device **(pump 24)** for increasing and decreasing the pressure of the driving medium **(pressurization medium M)** with which the driving room **(pressurization room 22)** is filled (YAJIMA: paragraph 17 and Fig. 1). The driving device **(24)** and driving room **(22)** are connected to each other via a tube **(channel 25)** through which the driving medium **(M)** flows (YAJIMA: paragraph 17 and Fig. 1). The combined references show that the pressurization room **(22)** and driving device **(24)** are at separate locations (YAJIMA: Fig. 1), but do not explicitly teach that the driving device **(24)** is located at a position other than the arm. However, the location of the driving device **(24)**, either on or off the movable arm, would not affect the operation of the apparatus in a patentably distinct

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way, and would therefore represent a rearrangement of parts that would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention (see MPEP 2144.04).

13. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over YAJIMA in view of KAWTA, SUTTER, and KAWANO as applied to claims 6-7 above, and in further in view of FEDULOV (Fedulov, A. I., *Journal of Mining Science*, 1979, vol 15, pp. 54-65).

14. Regarding claim 8, YAJIMA in view of KAWTA and SUTTER teaches an apparatus in which the driving medium (**pressurization medium M**) of the flexible film (**flexible tube 21**) is expanded by decreasing the volume of the medium (**M**) in the driving room (**pressurization room 22**), and the flexible film (**21**) is shrunk by increasing the volume of the incompressible medium (**M**) (YAJIMA: paragraphs 10, 17, and Fig. 3). The combined references do not specify that the medium (**M**) is incompressible. However, it is well-known in the art that incompressible fluids transfer pressure quickly as compared to compressible media, as is taught by FEDULOV (FEDULOV, page 2, paragraph 1). One of ordinary skill in the art at the time of the invention, would therefore have found it *prima facie* obvious to choose an incompressible fluid as a driving medium, with the reasonable expectation that such a design choice would allow for quick pressure transfer from the driving device to the driving room.

Response to Arguments

15. The amendment filed on 12/22/2009 has been entered and fully considered but are not persuasive. Claims 5-12 are pending of which 9-12 are new. Claims 1-4 have been cancelled by the applicant.

16. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

17. Applicant argues that the combined references of YAJIMA and KAWANO fail to teach the limitations of claim 9 because the pump of YAJIMA is not trivially modifiable to include a separate water control path for the heat exchanger of KAWATA. However, the standard for obviousness under U.S.C. 103(a) does not depend on how trivial the modification of the prior art would be, but rather on whether one of ordinary skill in the art at the time of the invention would have found some teaching, suggestion, or motivation to undertake the modification. In the instant case, KAWATA teaches that the double tube of the heat exchanger is preferentially disposed along the entire length of the chemical flow path (KAWATA: column 3, lines 28-31). As the pump room (**pressurization room 22**) of YAJIMA is within the flow path of the chemical, the addition of KAWATA to YAJIMA would necessarily require adding a temperature-control water flow path to the pump. Furthermore, similar design concepts have been applied in the prior art, such as SKIDMORE (US Patent No. 3738409), which shows a

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pump (**pump 21**) modified to be disposed within a heat exchanger (**jacket 61**)

(SKIDMORE: column 3, lines 12-15 and Figs. 2-3).

Conclusion

18. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALBERT HILTON whose telephone number is (571)-270-5519. The examiner can normally be reached on Monday through Friday from 8:00 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571)-272-1435. The fax phone

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number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ALBERT HILTON/
Examiner, Art Unit 1792

/Parviz Hassanzadeh/
Supervisory Patent Examiner, Art Unit 1792